

February 27, 2019

Manitoba Sustainable Development Client File No: 5577.00

Manitoba Sustainable Development EAL No: 3010

Attention: Peter Crocker, Regional Supervisor
Manitoba Sustainable Development
Environmental Compliance and Enforcement Branch
Box 13, 1129 Queens Avenue
Brandon, MB R7A 1L9

Dear Mr. Crocker,

Reference: Daly Irrigation Project – 2018 Monitoring Report

On behalf of Daly Irrigation Development Group (DIDG; the Licencee), AgriEarth Consulting Ltd. (AgriEarth) submits the following 2018 monitoring report for the Daly Irrigation Project (the Project). This letter provides a summary and status of monitoring data collected in 2018, as required by *Environment Act* Licence No. 3010 (the Licence), issued on July 5, 2012.

The following information is presented:

- Upstream and downstream flows, volumes and rates of water pumped, and durations of pumping as prescribed by Clause 21 of the Licence.
- Results of the Dissolved Oxygen Monitoring Program as prescribed by Clause 22 of the Licence.
- Photographs of the Little Saskatchewan River riffle bed exposure immediately downstream of the diversion point of the Project as prescribed by Clause 23 of the Licence.

MEASUREMENT OF UPSTREAM AND DOWNSTREAM FLOW RATES

In accordance with Clause 21 of the Licence, flow rates are to be recorded upstream and downstream of the diversion point on a daily basis while irrigation is occurring.

The upstream monitoring point is located at the Water Survey of Canada (WSC) Little Saskatchewan River near Rivers (05MF018) hydrometric station, close to the crossing of Highway 25 over Little Saskatchewan River. WSC flow and level data recorded at this station is used to monitor the river condition upstream of the diversion point.

Flows downstream of the diversion point were estimated by subtracting the maximum daily pumping discharge from the average daily upstream flow rate. These rates were calculated on a daily basis throughout the irrigation period (May 18 to September 6, 2018). Figure 1 shows the average daily upstream flow rates and the estimated downstream flow rates relative to the minimum in-stream flow of

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0.524 m³/sec prescribed in the Licence. Throughout the irrigation period the estimated average daily flows downstream of the diversion point were above the minimum instream flow requirement of 0.524 m³/sec.

VOLUMES AND RATES OF WATER PUMPED

A summary of daily pump volumes and rates recorded at the diversion point are provided in Table 1. Flow meters on the pumps measure instantaneous flow rate, total daily volume and accumulated volumes over the season. As such, duration of pumping is not required to determine volume and rates, but it can be calculated, if necessary.

The daily maximum pumping rate did not exceed the maximum pumping rate of 0.555 m³/s specified by the Licence.

A total volume of 638,064,000 US gallons or 1,958 ac-ft were pumped for irrigation in 2018.

DISSOLVED OXYGEN CONCENTRATION

In accordance with Clause 22 of the Licence, a Dissolved Oxygen (DO) Monitoring Program was implemented in spring of 2017 with deployment of the HOB0® U26-001 DO Logger. The purpose of the DO Monitoring Program is to determine if the Project is having an impact on DO concentration and fish habitat within the Little Saskatchewan River downstream from the diversion point. Impacts to fish habitat are conceivable when DO concentration drops to 2-4 mg/L. Fish kills may occur at DO concentrations of <2 mg/L. Optimal habitat conditions within the river are achieved at a DO concentration of 5-8 mg/L.

The DO logger was deployed on June 21, and recorded DO and temperature values at 30-minute intervals until the logger was retrieved on October 17. While flow rates fell below the monitoring threshold of 6 m³/s on May 29 and 30, they increased above this rate until June 19, when they again fell below the threshold for the remainder of the irrigation period.

Daily average, minimum, and maximum DO concentration and daily average temperature were calculated from the logger data and are summarized in Figure 3. The average daily DO concentration did not fall below the lower limit of the optimum range of 5 mg/L during the irrigation period. The recorded minimum DO concentration was below 4 mg/L for approximately 10 days during the approximate 90 days within the irrigation period during which DO was monitored. DO concentrations fell below 2 mg/L two times in early July (July 5-6 – 1.9 mg/L, July 7-8 – 1.0 mg/L). The average DO concentration over the portion of the irrigation period when DO was monitored was 8.6 mg/L.

RIFFLE MONITORING

Under Clause 23 of the Licence, the Licencee is required to provide photographs of the riffle bed exposure in the Little Saskatchewan River downstream from the Project's diversion point during the irrigation season. A trail camera was installed on May 20 to record daily photographs of the riffle. However, at some point after June 19, the tree on which the trail camera was mounted fell and destroyed the camera and memory card. Therefore, riffle photos were collected and are available from May 20 to June 19, 2018.

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Photos 1 and 2 (Attachment 3) provide a visual representation of moderate flow rate conditions during the early portion of the irrigation season with and without pumping, respectively. The lowest water levels at the upstream station were recorded in late August and early September. Photos 3 and 4 provide a visual representation of this low water level condition with and without pumping, respectively (note: these photos are from comparable flow rate conditions from 2017 as 2018 photos were not available during this period of low flows).

A complete set of photographs taken by the trail camera will be provided on CD-ROM.

CLOSURE

This letter report was prepared by AgriEarth Consulting Ltd. The letter, including all contents and attachments, reflects the professional judgment of AgriEarth Consulting Ltd., and was developed based on existing and available information at the time it was published. Information provided by other parties was not verified by AgriEarth Consulting Ltd. Use of information in this report by a third party is done so at the sole responsibility and risk of the third party. AgriEarth Consulting Ltd. cannot be held responsible whatsoever for uses by the third party, including any costs or damages of any kind, if any, suffered by it or any other third party, as a result of decisions made or actions taken based on information in this document.

We trust the information presented satisfies the annual monitoring report requirements under the Licence. Should you have any questions on the information presented, please contact the undersigned.

Regards,



David Whetter, M.Sc., P.Ag.
Senior Soil Scientist and Professional Agrologist
335 Elm Street
Winnipeg, MB R3M 3N6
c: (204) 799-4877
e: david.whetter@agriearth.ca

Attachment: Attachment A – Figures
Attachment B – Water Use Summary
Attachment C – Riffle Photos

c. Ed Waldner – Daly Irrigation Development Group; Bruce Webb – Manitoba Sustainable Development

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report

Attachment A
Figures

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report

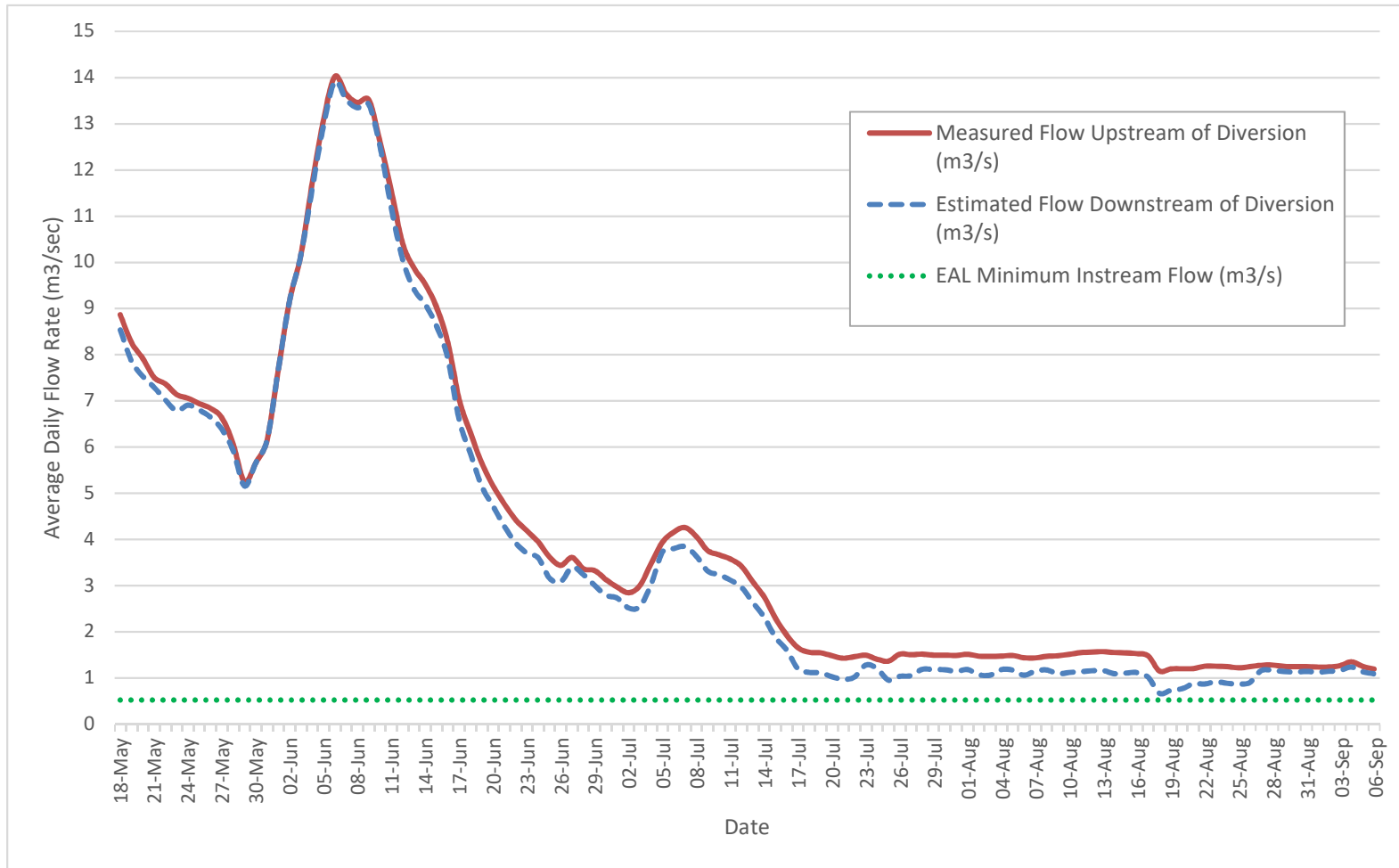


Figure 1: Average daily discharge upstream and downstream of diversion during irrigation period

Attachments

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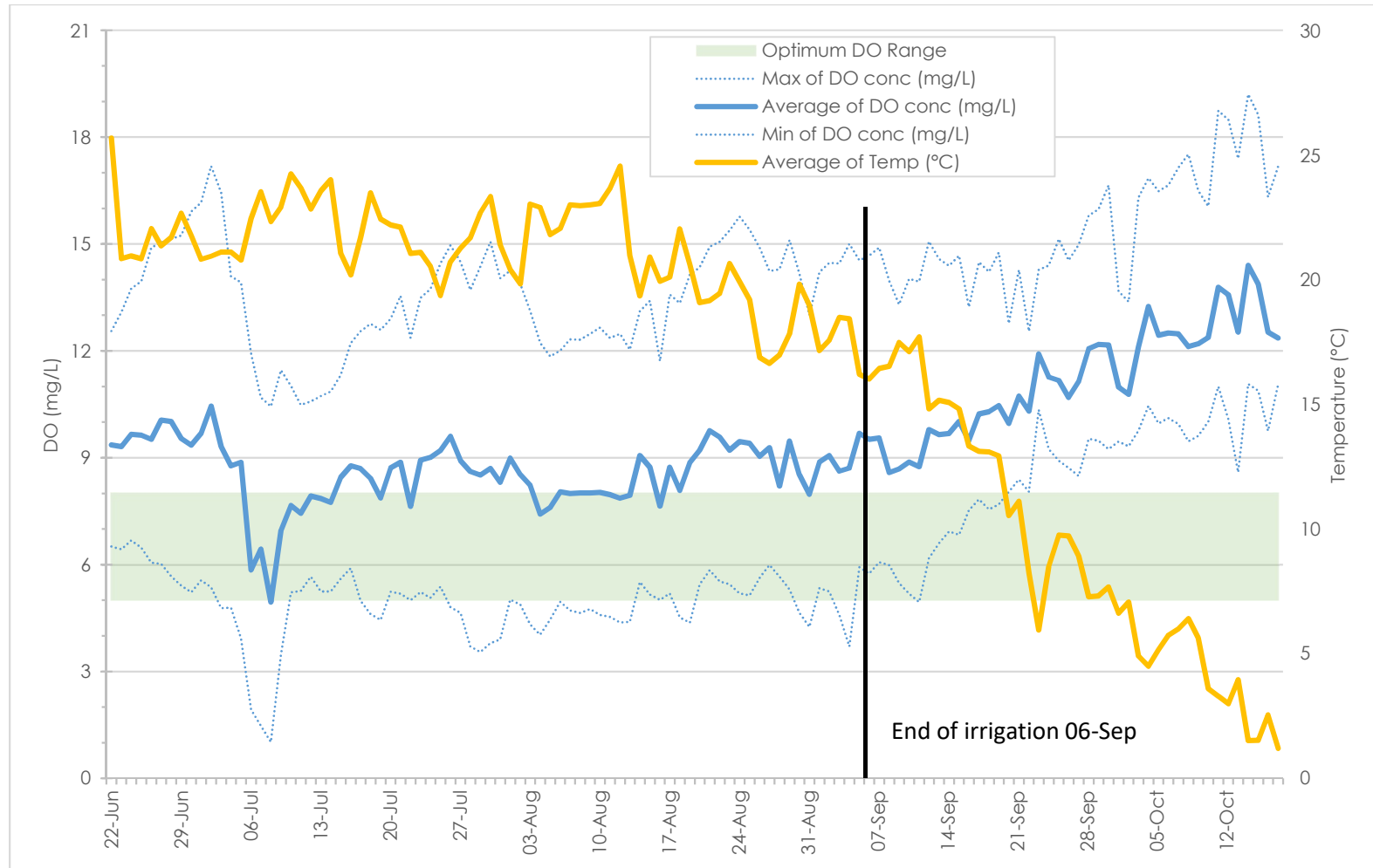


Figure 2: Daily dissolved oxygen concentration and temperature downstream of the diversion

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report

Attachment B
Water Use Summary

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report

Date	Keyriver		Redfern		Sundance (Pump 1)		Sundance (Pump 2)		Total Volume Pumped (gal)	Total Volume Pumped (ac-ft)	Total Volume Pumped (m ³)	Max Pumping Rate (gal/min)	Max Pumping Rate (m ³ /s)
	Intake Location: NW 10-12-21W		Intake Location: NW10-12-21W		Intake Location: NW10-12-21W		Intake Location: NW10-12-21W						
	Pump Capacity: 2400 US gpm (0.1514 m ³ /s)		Pump Capacity: 2400 US gpm (0.1514 m ³ /s)		Pump Capacity: 2400 US gpm (0.1514 m ³ /s)		Pump Capacity: 1600 US gpm (0.1001 m ³ /s)						
	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)					
2017-05-17	0	0	0	0	0	0	0	0	0	0.0	0	0	0.000
2017-05-18	1,030,992	1,482	0	0	539,866	2,164	1,287,175	1,564	2,858,032	8.8	10,819	5,210	0.329
2017-05-19	1,328,502	2,342	0	0	1,913,235	2,387	2,397,265	1,602	5,639,002	17.3	21,346	6,331	0.399
2017-05-20	2,278,949	2,471	0	0	2,227,675	2,029	2,387,851	1,626	6,894,475	21.2	26,098	6,126	0.386
2017-05-21	0	0	0	0	1,766,547	1,791	2,381,961	1,592	4,148,509	12.7	15,704	3,383	0.213
2017-05-22	851,713	2,188	0	0	1,678,759	1,660	2,374,607	1,660	4,905,079	15.1	18,568	5,508	0.348
2017-05-23	3,010,302	2,182	0	0	2,121,186	1,758	2,075,242	1,638	7,206,730	22.1	27,280	5,577	0.352
2017-05-24	3,153,839	2,340	0	0	0	0	0	0	3,153,839	9.7	11,939	2,340	0.148
2017-05-25	2,413,799	2,211	0	0	0	0	0	0	2,413,799	7.4	9,137	2,211	0.139
2017-05-26	533,162	1,413	1,703,360	1,666	1	0	0	0	2,236,523	6.9	8,466	3,079	0.194
2017-05-27	2,834,841	2,241	2,372,832	1,674	0	0	0	0	5,207,673	16.0	19,713	3,915	0.247
2017-05-28	2,322,513	2,242	0	0	0	0	0	0	2,322,513	7.1	8,792	2,242	0.141
2017-05-29	537,884	1,417	0	0	0	0	0	0	537,884	1.7	2,036	1,417	0.089
2017-05-30	0	0	0	0	0	0	0	0	0	0.0	0	0	0.000
2017-05-31	0	0	0	0	1	0	0	0	1	0.0	0	0	0.000
2017-06-01	0	0	0	0	0	0	0	0	0	0.0	0	0	0.000
2017-06-02	0	0	0	0	0	0	0	0	0	0.0	0	0	0.000
2017-06-03	0	0	0	0	0	0	0	0	0	0.0	0	0	0.000
2017-06-04	0	0	1,813,088	1,937	0	0	0	0	1,813,088	5.6	6,863	1,937	0.122
2017-06-05	1	0	1,792,896	1,961	0	0	0	0	1,792,897	5.5	6,787	1,961	0.124
2017-06-06	0	0	2,331,232	1,781	0	0	0	0	2,331,232	7.2	8,825	1,781	0.112

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	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)					
2017-06-07	0	0	2,360,160	1,804	0	0	0	0	2,360,160	7.2	8,934	1,804	0.114
2017-06-08	0	0	1,468,800	1,766	0	0	0	0	1,468,800	4.5	5,560	1,766	0.111
2017-06-09	0	0	1,740,032	1,612	0	0	0	0	1,740,032	5.3	6,587	1,612	0.102
2017-06-10	0	0	2,295,072	1,666	0	0	0	0	2,295,072	7.0	8,688	1,666	0.105
2017-06-11	0	0	2,180,096	1,728	1,899,819	2,393	2,173,756	1,583	6,253,671	19.2	23,673	5,703	0.360
2017-06-12	0	0	1,973,344	1,547	3,405,804	2,372	2,239,859	1,612	7,619,007	23.4	28,841	5,532	0.349
2017-06-13	776,276	1,418	1,420,448	1,804	3,118,527	2,395	2,195,062	1,623	7,510,313	23.0	28,430	7,240	0.457
2017-06-14	1,923,110	1,500	1,983,840	1,542	1,979,155	2,301	2,228,623	1,609	8,114,728	24.9	30,718	6,951	0.439
2017-06-15	486,879	1,362	747,328	1,391	1,561,678	2,070	2,223,772	1,584	5,019,657	15.4	19,001	6,406	0.404
2017-06-16	0	0	2,019,072	1,515	2,768,451	2,301	2,354,521	1,622	7,142,045	21.9	27,036	5,438	0.343
2017-06-17	2,192,989	2,148	2,145,888	1,577	2,170,421	1,709	2,033,082	1,609	8,542,380	26.2	32,336	7,042	0.444
2017-06-18	2,855,381	2,174	2,136,448	1,601	2,180,699	1,670	2,010,026	1,670	9,182,553	28.2	34,760	7,115	0.449
2017-06-19	2,207,028	2,439	2,101,024	1,533	2,780,089	2,374	2,105,423	1,674	9,193,563	28.2	34,801	8,021	0.506
2017-06-20	2,001,069	1,452	2,014,016	1,503	3,434,751	2,355	2,134,236	1,655	9,584,072	29.4	36,280	6,965	0.439
2017-06-21	2,318,001	2,150	2,054,144	1,598	3,067,786	2,310	2,075,519	1,610	9,515,450	29.2	36,020	7,669	0.484
2017-06-22	3,151,763	2,410	2,016,032	1,438	3,128,785	2,395	1,996,334	1,695	10,292,914	31.6	38,963	7,939	0.501
2017-06-23	2,983,828	2,427	1,208,000	1,353	3,134,297	2,356	1,968,747	1,556	9,294,872	28.5	35,185	7,691	0.485
2017-06-24	2,724,413	1,958	0	0	2,865,924	2,010	1,940,675	1,510	7,531,012	23.1	28,508	5,478	0.346
2017-06-25	2,716,261	2,048	1,287,328	1,214	3,113,790	2,390	741,123	1,590	7,858,502	24.1	29,748	7,241	0.457
2017-06-26	2,764,802	2,060	1,712,320	1,208	2,799,922	2,319	0	0	7,277,045	22.3	27,547	5,587	0.352
2017-06-27	1,269,517	2,008	1,727,776	1,308	0	0	0	0	2,997,293	9.2	11,346	3,316	0.209

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2017-06-28	0	0	0	0	1,296,742	2,027	0	0	1,296,742	4.0	4,909	2,027	0.128
2017-06-29	57,780	1,349	0	0	2,869,815	2,109	893,827	1,609	3,821,422	11.7	14,466	5,067	0.320
2017-06-30	1,400,766	1,353	0	0	3,065,328	2,345	1,905,987	1,645	6,372,081	19.6	24,121	5,344	0.337
2017-07-01	0	0	0	0	1,625,151	2,166	1,928,751	1,566	3,553,902	10.9	13,453	3,733	0.236
2017-07-02	0	0	1,862,560	1,355	1,772,083	2,341	1,887,958	1,541	5,522,601	16.9	20,905	5,238	0.330
2017-07-03	1,386,183	1,870	1,861,344	1,370	2,929,129	2,309	1,908,795	1,609	8,085,450	24.8	30,607	7,159	0.452
2017-07-04	2,587,520	2,132	1,768,544	1,261	138,172	1,982	1,985,487	1,682	6,479,722	19.9	24,528	7,056	0.445
2017-07-05	2,652,882	2,091	547,008	1,267	0	0	0	0	3,199,890	9.8	12,113	3,358	0.212
2017-07-06	2,877,814	2,294	1,079,200	1,497	1,698,851	1,866	0	0	5,655,865	17.4	21,410	5,657	0.357
2017-07-07	2,738,142	1,985	1,978,688	1,506	2,113,848	1,528	1,905,483	1,528	8,736,161	26.8	33,070	6,547	0.413
2017-07-08	2,514,147	1,998	2,044,544	1,604	2,170,274	1,566	1,862,546	1,566	8,591,511	26.4	32,522	6,733	0.425
2017-07-09	2,352,024	1,684	2,129,888	1,630	2,540,145	2,062	1,887,592	1,662	8,909,648	27.3	33,727	7,038	0.444
2017-07-10	2,272,362	1,619	2,135,840	1,509	2,787,470	2,173	1,896,609	1,554	9,092,281	27.9	34,418	6,855	0.432
2017-07-11	2,557,960	1,931	1,929,824	1,636	1,889,358	2,057	1,896,008	1,607	8,273,150	25.4	31,317	7,231	0.456
2017-07-12	2,383,209	1,796	1,978,176	1,491	2,893,511	2,263	1,825,890	1,634	9,080,786	27.9	34,374	7,184	0.453
2017-07-13	2,306,829	1,716	1,972,224	1,497	2,870,840	2,237	1,750,728	1,598	8,900,621	27.3	33,692	7,049	0.445
2017-07-14	2,222,171	1,575	2,072,896	1,586	2,494,493	2,111	1,894,900	1,682	8,684,460	26.7	32,874	6,954	0.439
2017-07-15	156,693	1,552	2,086,752	1,544	2,505,059	1,840	1,856,328	1,673	6,604,832	20.3	25,002	6,610	0.417
2017-07-16	0	0	1,918,784	1,630	2,375,807	1,827	1,787,169	1,677	6,081,759	18.7	23,022	5,134	0.324
2017-07-17	194,591	1,756	1,757,408	2,236	2,343,764	1,690	1,787,098	1,613	6,082,861	18.7	23,026	7,295	0.460
2017-07-18	2,578,809	1,954	2,143,936	1,577	2,416,055	1,785	1,728,916	1,582	8,867,716	27.2	33,568	6,899	0.435

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	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)					
2017-07-19	2,491,462	1,883	2,087,872	1,533	2,557,813	1,828	1,799,556	1,595	8,936,703	27.4	33,829	6,839	0.431
2017-07-20	2,381,493	1,843	2,206,944	1,725	2,606,360	2,025	1,861,297	1,607	9,056,094	27.8	34,281	7,200	0.454
2017-07-21	2,407,029	1,851	2,172,992	1,692	2,800,054	2,073	1,757,993	1,624	9,138,068	28.0	34,591	7,240	0.457
2017-07-22	2,448,452	1,865	2,117,184	1,686	1,004,143	1,827	1,750,994	1,588	7,320,773	22.5	27,712	6,966	0.439
2017-07-23	2,343,555	1,798	2,115,168	1,536	0	0	0	0	4,458,723	13.7	16,878	3,334	0.210
2017-07-24	1,941,889	1,650	2,139,360	1,547	0	0	0	0	4,081,249	12.5	15,449	3,197	0.202
2017-07-25	2,045,932	1,812	2,066,304	1,512	1,144,395	1,593	1,833,057	1,593	7,089,688	21.8	26,837	6,510	0.411
2017-07-26	2,567,220	2,170	2,029,856	1,509	2,317,009	2,311	1,816,287	1,623	8,730,373	26.8	33,048	7,614	0.480
2017-07-27	1,687,075	1,839	2,085,856	1,657	2,573,949	2,012	1,998,516	1,679	8,345,396	25.6	31,591	7,187	0.453
2017-07-28	0	0	2,123,360	1,595	2,600,674	2,007	1,896,343	1,589	6,620,377	20.3	25,061	5,191	0.328
2017-07-29	0	0	2,100,160	1,577	2,509,132	1,793	1,820,109	1,571	6,429,401	19.7	24,338	4,941	0.312
2017-07-30	0	0	1,340,256	1,527	2,512,919	1,855	1,905,997	1,627	5,759,172	17.7	21,801	5,009	0.316
2017-07-31	0	0	1,601,728	2,014	2,312,262	1,881	1,987,921	1,573	5,901,911	18.1	22,341	5,468	0.345
2017-08-01	0	0	2,235,264	1,686	2,571,632	1,850	1,919,260	1,667	6,726,156	20.6	25,461	5,203	0.328
2017-08-02	2,062,586	1,723	1,773,696	1,264	2,415,169	1,729	1,843,909	1,651	8,095,359	24.8	30,644	6,367	0.402
2017-08-03	1,985,214	1,760	1,452,832	1,211	2,370,516	1,776	1,846,378	1,674	7,654,940	23.5	28,977	6,421	0.405
2017-08-04	0	0	1,591,456	1,178	2,361,862	1,835	1,858,365	1,621	5,811,683	17.8	22,000	4,634	0.292
2017-08-05	0	0	1,747,360	1,606	2,469,356	1,754	1,986,353	1,655	6,203,069	19.0	23,481	5,015	0.316
2017-08-06	434,559	1,362	1,721,632	1,246	2,444,258	1,796	1,935,662	1,608	6,536,110	20.1	24,742	6,012	0.379
2017-08-07	0	0	1,620,544	1,172	2,444,258	1,728	1,893,562	1,633	5,958,364	18.3	22,555	4,534	0.286
2017-08-08	0	0	1,499,936	1,166	2,600,520	1,931	1,875,345	1,578	5,975,801	18.3	22,621	4,675	0.295

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report

Date	Keyriver		Redfern		Sundance (Pump 1)		Sundance (Pump 2)		Total Volume Pumped (gal)	Total Volume Pumped (ac-ft)	Total Volume Pumped (m ³)	Max Pumping Rate (gal/min)	Max Pumping Rate (m ³ /s)
	Intake Location: NW 10-12-21W		Intake Location: NW10-12-21W		Intake Location: NW10-12-21W		Intake Location: NW10-12-21W						
	Pump Capacity: 2400 US gpm (0.1514 m ³ /s)		Pump Capacity: 2400 US gpm (0.1514 m ³ /s)		Pump Capacity: 2400 US gpm (0.1514 m ³ /s)		Pump Capacity: 1600 US gpm (0.1001 m ³ /s)						
	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)					
2017-08-09	85,905	1,797	1,348,352	948	2,497,116	1,808	1,907,353	1,617	5,838,726	17.9	22,102	6,170	0.389
2017-08-10	2,565,188	1,827	1,354,176	1,031	2,445,812	1,747	1,853,853	1,624	8,219,029	25.2	31,112	6,229	0.393
2017-08-11	2,601,479	1,999	1,489,280	1,116	2,399,428	1,775	1,932,292	1,661	8,422,479	25.8	31,883	6,552	0.413
2017-08-12	2,652,537	1,902	1,509,536	1,113	2,347,142	1,768	1,923,740	1,632	8,432,955	25.9	31,922	6,415	0.405
2017-08-13	2,554,219	1,904	1,148,672	1,045	2,561,885	1,866	1,865,615	1,644	8,130,390	25.0	30,777	6,460	0.408
2017-08-14	2,487,559	1,865	564,256	1,849	2,709,153	1,965	1,818,892	1,592	7,579,860	23.3	28,693	7,271	0.459
2017-08-15	2,268,075	1,960	1,264,352	1,477	2,594,097	1,935	1,728,734	1,562	7,855,259	24.1	29,735	6,934	0.437
2017-08-16	2,681,638	1,943	933,600	1,223	2,475,390	1,752	1,819,956	1,583	7,910,585	24.3	29,945	6,500	0.410
2017-08-17	1,992,787	1,750	2,177,824	2,047	2,493,222	1,967	1,688,052	1,574	8,351,885	25.6	31,615	7,338	0.463
2017-08-18	2,465,015	1,893	2,664,320	2,011	2,540,245	2,113	1,742,656	1,630	9,412,236	28.9	35,629	7,647	0.482
2017-08-19	2,440,407	1,845	2,764,288	1,967	2,513,896	1,866	1,737,255	1,627	9,455,846	29.0	35,794	7,305	0.461
2017-08-20	710,394	1,310	2,480,192	2,032	2,590,149	1,910	1,794,593	1,611	7,575,328	23.2	28,676	6,862	0.433
2017-08-21	0	0	600,704	1,804	2,497,641	1,797	1,807,892	1,623	4,906,237	15.1	18,572	5,224	0.330
2017-08-22	0	0	1,456,512	2,395	2,430,138	2,032	1,773,501	1,672	5,660,151	17.4	21,426	6,099	0.385
2017-08-23	0	0	2,652,256	1,866	2,510,777	1,813	1,708,735	1,651	6,871,768	21.1	26,012	5,330	0.336
2017-08-24	0	0	2,514,368	1,893	2,596,689	2,211	1,876,534	1,625	6,987,591	21.4	26,451	5,729	0.361
2017-08-25	0	0	2,498,784	1,754	2,515,786	2,149	1,783,647	1,659	6,798,217	20.9	25,734	5,562	0.351
2017-08-26	0	0	2,609,952	1,982	1,629,779	1,840	1,198,377	1,605	5,438,108	16.7	20,585	5,426	0.342
2017-08-27	0	0	2,607,552	1,840	0	0	0	0	2,607,552	8.0	9,871	1,840	0.116
2017-08-28	0	0	2,532,800	1,816	0	0	0	0	2,532,800	7.8	9,588	1,816	0.115
2017-08-29	0	0	2,096,544	1,745	0	0	0	0	2,096,544	6.4	7,936	1,745	0.110

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report

Date	Keyriver		Redfern		Sundance (Pump 1)		Sundance (Pump 2)		Total Volume Pumped (gal)	Total Volume Pumped (ac-ft)	Total Volume Pumped (m ³)	Max Pumping Rate (gal/min)	Max Pumping Rate (m ³ /s)
	Intake Location: NW 10-12-21W		Intake Location: NW10-12-21W		Intake Location: NW10-12-21W		Intake Location: NW10-12-21W						
	Pump Capacity: 2400 US gpm (0.1514 m ³ /s)		Pump Capacity: 2400 US gpm (0.1514 m ³ /s)		Pump Capacity: 2400 US gpm (0.1514 m ³ /s)		Pump Capacity: 1600 US gpm (0.1001 m ³ /s)						
	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)	Volume Pumped (gal)	Max Pumping Rate (gal/min)					
2017-08-30	0	0	2,116,864	1,849	0	0	0	0	2,116,864	6.5	8,013	1,849	0.117
2017-08-31	0	0	2,137,216	1,621	0	0	0	0	2,137,216	6.6	8,090	1,621	0.102
2017-09-01	0	0	2,263,008	1,772	0	0	0	0	2,263,008	6.9	8,566	1,772	0.112
2017-09-02	0	0	2,013,312	1,500	0	0	0	0	2,013,312	6.2	7,621	1,500	0.095
2017-09-03	0	0	2,064,160	1,648	0	0	0	0	2,064,160	6.3	7,814	1,648	0.104
2017-09-04	0	0	2,205,504	1,769	0	0	0	0	2,205,504	6.8	8,349	1,769	0.112
2017-09-05	0	0	2,235,520	1,834	0	0	0	0	2,235,520	6.9	8,462	1,834	0.116
2017-09-06	0	0	967,264	1,660	0	0	0	0	967,264	3.0	3,661	1,660	0.105
Totals	134,209,359	-	172,973,120	-	187,417,681	-	143,463,510	-	638,063,671	1,958.1	2,415,333	8,021	0.51

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report

Attachment C
Riffle Photos

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report



Photo 1: Early season, moderate water flow (5.661 m³/s upstream of diversion), no pumping for irrigation (estimated flow rate downstream of diversion 5.661 m³/s) (May 30, 2018)



Photo 2: Early season, moderate water flow (5.660 m³/s upstream of diversion; comparable to Photo 1 May 30, 2018), pumping withdrawal for irrigation (0.5060 m³/s removal) for estimated flow rate downstream of diversion of 5.153 m³/s) during pumping for irrigation (June 19, 2018)

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report



Photo 3: Photo from August 29, 2017 (1.116 m³/s upstream of diversion, 0.4625 m³/s pumping withdrawal, 0.6537 m³/s estimated downstream of diversion) as comparable photo for late season, low water flow with pumping on August 18, 2018 (1.153 m³/s upstream of diversion, 0.4825 m³/s pumping withdrawal, 0.6700 m³/s estimated downstream of diversion)

Attachments

Reference: Daly Irrigation Project – 2018 Monitoring Report



Photo 4: Photo from September 13, 2017 during no pumping withdrawal ($1.169 \text{ m}^3/\text{s}$ upstream of diversion, $1.169 \text{ m}^3/\text{s}$ estimated downstream of diversion) for comparison to Photo 3 with pumping withdrawal